



530 Main Street, Acton, MA 01720

**Phone:** (978)263-3584, **Fax:** (978)263-5086

**Web Site:** [www.acton-research.com](http://www.acton-research.com)

**Instructions for  
Adding or Interchanging Gratings  
in the SpectraPro™ Spectrometers**

If it becomes necessary to add or interchange gratings in the SpectraPro™ series of spectrometers, the following procedure is recommended. This procedure should be done only by personnel familiar with handling delicate optical components and familiar with the alignment of optical instruments. The following equipment is required:

- PC running Windows 95/98
- SpectraPro™ Monochromator Control Software and manual
- SC-1 Data Acquisition Package (or other data acquisition application)
- Alignment Mask (Ships with grating to be installed)
- Helium neon Laser
- Low Pressure Mercury Lamp

### **Setting the SpectraPro to Recognize the new Grating**

- Refer to the Monochromator control Software manual Section II for directions on how to install the Monochromator Control Software
- Refer to the Monochromator control Software Manual Section III for directions on how to operate the monochromator using the Monochromator Control Software
  1. From the Monochromator Control Software Main Window, select the Install Gratings Button.
  2. If you are replacing a grating on the turret, you must first remove the existing grating by selecting the grating to be removed in the grating list, and then selecting the Uninstall Button.
  3. To install a grating, select the grating position, then enter the Grooves and Blaze in the appropriate boxes and select install.
  4. The software will respond that you need to calibrate the grating, respond OK.
  5. This concludes the initial software installation of the grating.

### **Grating Installation and Alignment**

1. With the Monochromator on a clean solid bench with sufficient space, place the helium neon laser at the entrance slit.
2. Remove the screws from the cover on the SpectraPro™ and remove the cover.

**CAUTION: THE OPTICS ARE NOW EXPOSED, DO NOT TOUCH, TALK, OR BREATHE ON THE OPTICAL SURFACES. PERMANENT DAMAGE WILL BE CAUSED TO THE OPTICAL SURFACES BY MECHANICAL CONTACT WITH ANYTHING.**

3. From the Monochromator Control Software, select the Operations Button
4. From the Operations Window, select the grating you want to use, and verify the correct turret is selected. Most systems only have one turret, so turret 1 should be selected. If you have multiple turrets, make sure the correct turret is selected.
5. Enter 0.0 in the wavelength box and click the GoTo Button.
6. Refer to figure 1 and carefully place the alignment mask over the screw heads on the focusing mirror as shown.

**CAUTION: DO NOT LOOSEN OR REMOVE ANY SCREWS**

7. Align the helium neon laser so that the beam passes through the center of the entrance slits, and is centered on the intersection point of the horizontal line and the Longest vertical line with the alignment mask on the collimating mirror.

**CAUTION: DO NOT MOVE THE SPECTRAPRO™ OR LASER IN RELATION TO EACH OTHER FROM THIS POINT, OR THE ALIGNMENT WILL NOT BE CORRECT**

8. Refer to figure 2 and become familiar with the labeled components.
9. Rotate the following adjusting screws two (2) turns counter clockwise: height adjusting screw, tangent adjusting screw and zero adjusting screw.
10. Loosen the two (2) top plate clamp screws by rotating them one turn counter clockwise.
11. Become familiar with figures 3 and 4. Very carefully grasp the grating by its edges, remove the two (2) top plate clamping screws, and remove the grating top plate as a unit as shown in figure 3.

**CAUTION: THE TOP PLATE IS LOOSE, DO NOT TIP THE GRATING/TOP PLATE MORE THAN 40 DEGREES FROM THE VERTICAL**

12. Very carefully remove the top plate from the grating by lifting straight off of the two (2) pins.

**NOTE:** The two pins are attached to the grating.

13. Remove the cover from the grating to be installed, and put it on the grating that was removed.
14. Carefully place the removed top plate on the grating to be installed.
15. Do not tip the grating/top plate more than 40 degrees from the vertical, and carefully install the new grating/top plate assuring that the pin on the bottom of the grating is seated in the conical hole in the grating spindle. Install the two (2) top plate clamp screws and tighten.
16. With the alignment mask on the focus mirror turn the height adjusting screws until the laser beam is approximately centered in height on the horizontal line.

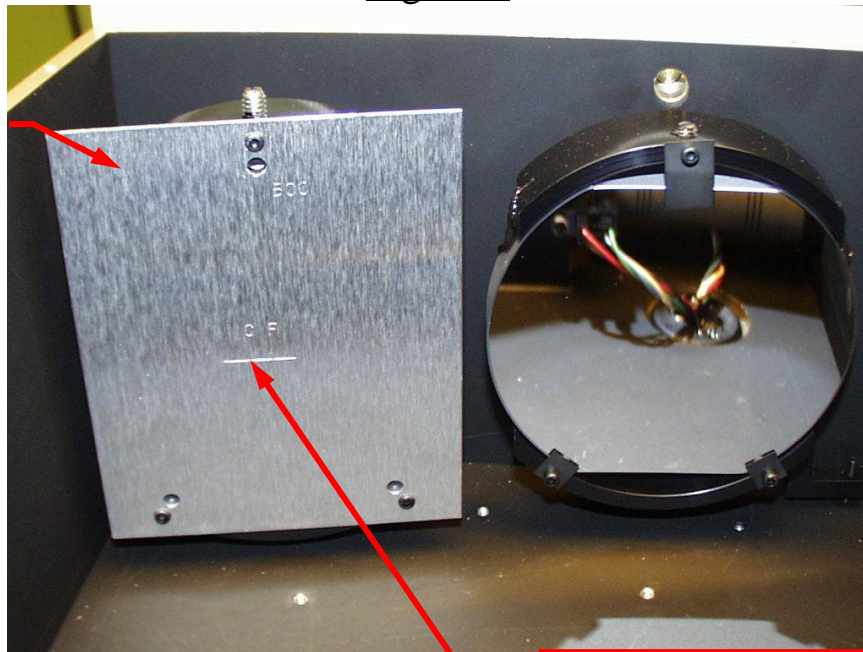
**CAUTION: DO NOT APPLY EXCESS FORCE TO ANY OF THE ADJUSTING SCREWS**

17. Turn the zero adjusting screw until the laser beam is approximately centered on the vertical line on the alignment mask. Scan the instrument to 632.8nm for the grating installed (when installing coarse grating, 76 g/mm etc., scan to longest 632.8nm order visible, such as 6<sup>th</sup> or 8<sup>th</sup> order). Adjust the tangent screw until the diffracted laser beam is centered on the horizontal line of the alignment mask. Repeat the above adjustments until the laser beam is centered on the cross lines of the alignment mask at zero and centered on the horizontal line at 632.8nm.

**Note:** If the relation of the laser or SpectraPro™ was altered during the interchange of the gratings, scan to zero for one of the other gratings and realign the laser. Re-scan to new grating and realign if necessary.

Figure 1

Alignment Mask



Align laser on this short vertical line and horizontal line

Figure 2

Top Plate

2 Top Plate Clamp Screws

Tangent adjusting Screw

Grating

Zero Adjusting Screw

Height Adjusting Screw

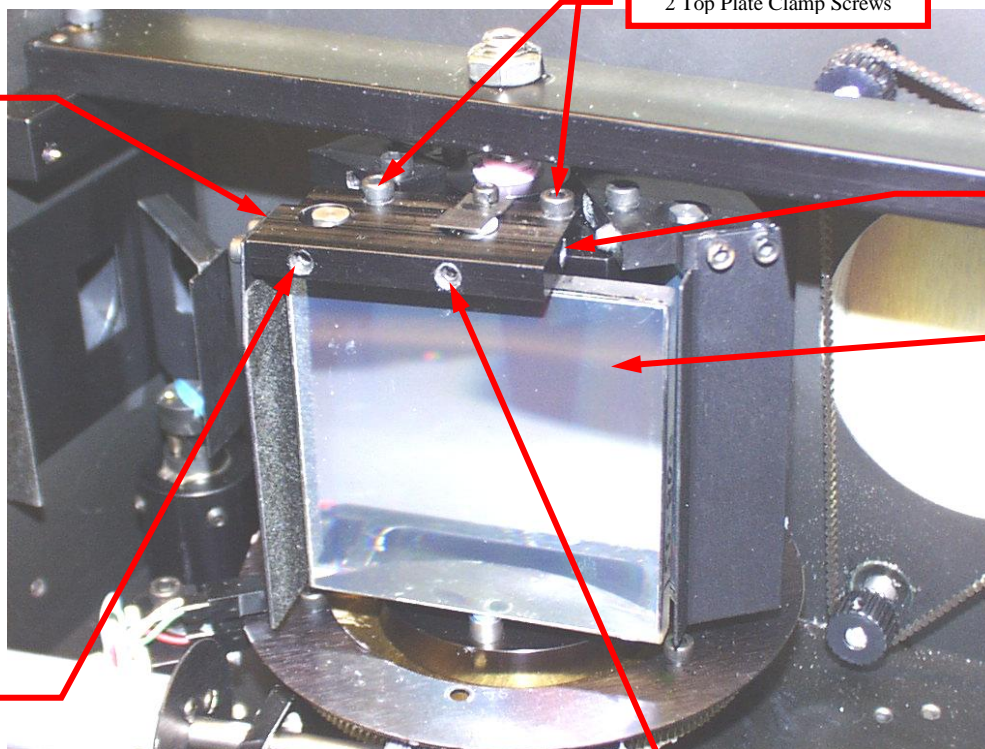


Figure 3

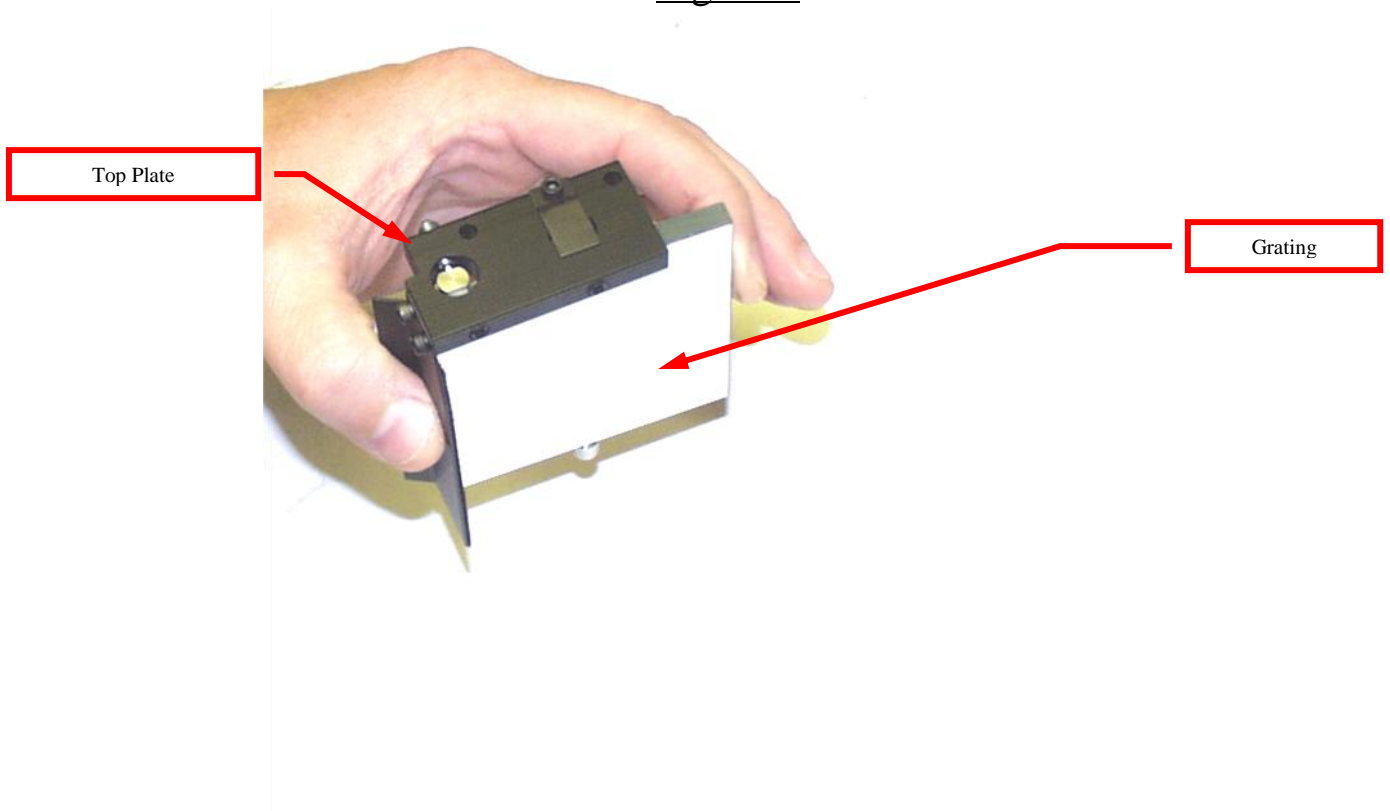


Figure4

Top Plate

Grating and Top Plate

Top Pins

Grating and Top Plate

Bottom Pin

